

REPORT TO THE ALASKA BOARD OF FISHERIES
KUSKOKWIM AREA SALMON, 1989

By:

R. Kim Francisco
Charles Burkey
Doug Molyneaux
Dan Schneiderhan
Cindy Anderson

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AUTHORS

R. Kim Francisco is Kuskokwim Area Management Biologist for the Alaska Department of Fish and Game, Division of Commercial Fisheries, P.O. Box 90, Bethel, AK 99559

Charles Burkey Jr is Assistant Area Management Biologist for the Alaska Department of Fish and Game, Division of Commercial Fisheries, P.O. Box 90, Bethel, AK 99559

Doug Molyneaux is a Salmon Research Project Leader for the Alaska Department of Fish and Game, Division of Commercial Fisheries, P.O. Box 90, Bethel, AK 99559

Dan Schneiderhan is a Salmon Research Project Leader for the Alaska Department of Fish and Game, Division of Commercial Fisheries, 333 Raspberry Road, Anchorage, AK 99508

Cindy Anderson is the Kuskokwim Area Commercial Fisheries Catch Monitor for the Alaska Department of Fish and Game, Division of Commercial Fisheries, P.O. Box 90, Bethel, AK 99559

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INTRODUCTION

The Kuskokwim Area includes the Kuskokwim River drainage and all waters of Alaska between Cape Newenham and the Naskonat Peninsula (Figure 1). Commercial salmon fishing takes place in four districts: District 1, the Lower Kuskokwim River, the portion of the Kuskokwim River upstream of Popokamiut to the regulatory markers located above the Bogus Creek confluence (Figure 2). District 2, the Middle Kuskokwim River, the Kuskokwim River upstream from regulatory markers at the High Bluffs to the regulatory markers at Chuathbaluk (Figure 3). District 4, Quinhagak, the portion of Kuskokwim Bay between the mouth of Oyak Creek and the South Mouth of the Arolik River (Figure 4). District 5, Goodnews Bay, consists of the waters of Goodnews Bay (Figure 5).

MANAGEMENT OBJECTIVES AND PROJECTS

Subsistence and commercial fisheries in the Kuskokwim Area are managed by the Alaska Department of Fish and Game's Division of Commercial Fisheries. The Department's goal is to manage both fisheries on a sustained yield basis within the policies set forth by the Alaska Board of Fisheries.

Subsistence Fishery

Subsistence needs are given priority use of the Kuskokwim Area salmon resources. The Kuskokwim Area subsistence salmon fishery is one of the largest and most important in the state, with over 1,300 families participating. Subsistence catches of chinook salmon in the Kuskokwim River often exceed the commercial catch of this species. There is substantially more time for subsistence fishing than commercial fishing in all areas. For example, during the 1989 fishing season in District 1, fishermen could subsistence fish for 82 days while there were 21 days with commercial fishing periods.

Regulations

The subsistence fishery is subject to few restrictions, however some restrictions are necessary to deter illegal commercial fishing and ensure adequate escapement. Because most subsistence fishermen also fish commercially, there is a temptation for fishermen to sell fish caught during commercial closures. To discourage such activity, the subsistence fishery is subjected to short closures before, during, and following commercial periods. In District 1 these subsistence closures include the commercial fishing district and Kuskokuak Slough but not tributaries of the Kuskokwim River. In Districts 2, 4 and 5 the subsistence closures apply to the commercial districts and spawning tributaries. In 1988 the main stem of the Kuskokwim River between Districts 1 and 2 was included in the District 1 subsistence closures.

The inclusion of the Kuskokwim River between Districts 1 and 2 in the subsistence closure appeared to be a very successful regulation change. Prior to enactment of this regulation only 1 to 3 boats were observed fishing in this area during subsistence fishing periods. Preceding and during commercial openings, when this area remained open to subsistence fishing, the effort would increase to as many as 20 boats. Closing this area appeared to solve the problem since only 3 closed water citations have been issued there.

Harvest Surveys

The Division of Commercial Fisheries began annual subsistence salmon harvest surveys of Kuskokwim River communities in 1960, of Quinhagak in 1967, and the Goodnews Bay district in 1979. In 1988 the Division of Subsistence took over the annual surveys under a memorandum of agreement with the Commercial Fisheries Division. The project goals are:

1. To obtain estimates of the subsistence salmon catch, by species, for 32 Kuskokwim Area communities.
2. To achieve a total (expanded) harvest estimate for subsistence-caught salmon by species for the Kuskokwim Area.
3. To identify issues affecting subsistence.
4. To update community household lists and identify fishing households in Kuskokwim Area communities.

The Subsistence Division mailed 1989 subsistence "catch calendars" and household reply cards to over 1500 Kuskokwim Area households. Fishermen were interviewed and calendars were collected during house to house surveys conducted in October and November. This is the first year the surveys were conducted in October and November. The two divisions determined that the later survey timing was necessary to get more complete catch data, particularly on coho salmon.

Commercial Fishery

The commercial fishery has expanded during the last ten years. This expansion is due to increased participation by individual fishermen and improvements in fishing gear, tendering, and processing capabilities. In 1989, a record 824 of the 832 permit holders made at least one landing (Table 1). Permit holders transfer freely between districts. Commercial harvest guidelines and gear restrictions have offset increases in fishing effort and efficiency so that adequate subsistence harvests and average spawning escapements are maintained.

In 1987 the Board of Fisheries adopted the JOINT STATEMENT ON THE MANAGEMENT OF THE KUSKOKWIM RIVER SALMON FISHERY. The Department, local Fish and Game advisory committees, subsistence and commercial fishermen, and processors drafted the statement. The statement's goal is to increase the sustained yield

of Kuskokwim River salmon stocks so that they can provide for subsistence needs and an economically viable commercial fishery. To achieve this goal the Kuskokwim River salmon users formed a working group with two purposes:

1. To arrive at a consensus regarding the openings and closures of the Kuskokwim River fishery.
2. To work towards the development of a comprehensive management plan for all Kuskokwim River salmon stocks.

The Kuskokwim River Salmon Management Working Group (Working Group) continued to work closely with the Department in 1989. Through uncommon dedication by all the concerned parties (there were 27 meetings in 1989) the Working Group provided in-season management recommendations that helped accomplish management objectives.

Escapement Monitoring

The area's major spawning systems received provisional spawning escapement objectives in 1983. Objectives were the average escapement counts obtained in these systems since 1959. The objectives represent the escapement levels needed to maintain the salmon stocks at past levels of abundance. Continuing assessment of the escapement data has required adjustment of the objectives to present the most accurate index of escapement available.

Annual spawning escapements are indexed by; aerial surveys of "key" streams and lakes throughout the area, a weir project on the Kogruklu River, sonar counter in the Aniak River, and a counting tower on the Goodnews River. Turbid water conditions and inclement weather often prevent accurate estimates of escapements.

Timely escapement estimates for in-season management are difficult to obtain. Most spawning streams are located many miles upstream of the commercial fishing districts. Therefore, escapement estimates are often obtained too late for adjustment of fishing time. In-season management depends heavily on commercial catch data and the Department test fishery located at Bethel.

Three research projects are being developed to help assess in-season run strength; the Eek test fishery, main river sonar and subsistence test fishery.

The Eek test fishery, located near the mouth of Kuskokwim River, is the most developed of these projects. Operation of this project is directed by the Working Group and sponsored by Kemp-Paulucci Seafoods and the Department. Although limited by inconsistencies and logistics problems, the Eek test fishery has been useful for making in-season management decisions by providing an earlier assessment of run strength than the Department test fishery near Bethel.

Development of a dual beam side-scanning sonar project in the Kuskokwim River began in 1988. A suitable location to successfully operate the sonar equipment was found in 1988. The primary objective in 1989 was to obtain various

on 15 June in 1989. The commercial chinook salmon harvest level in District 4 is about 15,000 unless commercial catch data or aerial escapement surveys indicate that additional harvest can be allowed.

Sockeye salmon become the target species when chinook salmon are less than 50 percent of the chinook-sockeye salmon catch in District 4. Commercial fishing time often increases after the less abundant chinook salmon have passed through the district. Weak escapements of sockeye salmon result in a reduction of fishing time.

The chum salmon catch is incidental to the sockeye salmon fishery in District 4. No special management actions for chum salmon are taken.

Commercial coho salmon harvests in District 4 have ranged from 30,000 to 135,000 fish recently (Table 4). Intermittent aerial escapement surveys along with commercial catch data provide the only in-season assessment of run strength. Normally, three (Monday, Wednesday, Friday) 12-hour (0600 to 1800 hours) commercial fishing periods per week allow adequate spawning escapements and subsistence harvests. Inclement weather often disrupts the fishing effort in District 4 during the coho salmon return. The three period per week schedule usually compensates for any fishing time "lost" due to weather. District 4 closes by regulation on 8 September.

Goodnews Bay (District 5)

District 5 normally opens between 11 and 20 June depending on the entry pattern of chinook salmon into the Goodnews River. The district is managed for sockeye salmon with a special emphasis on protection of chinook salmon from over harvest. The small stock size of chinook salmon and the increased fleet efficiency has caused special concern for chinook salmon. Waiting until the earlier migrating chinook salmon begin entering the river helps prevent an overharvest during the sockeye salmon fishery. The normal amount of fishing time when chinook salmon are in the district is two 12-hour periods per week. The commercial chinook salmon harvest averages about 5,000 fish (Table 5).

Sockeye salmon are the target species in June and July in District 5. Once the less abundant chinook salmon have passed through the district, it is often possible to increase commercial fishing time to three 12-hour periods per week. Weak escapements of sockeye salmon result in a reduction of fishing time.

The chum salmon catch is incidental to the sockeye salmon fishery in District 5. No special management actions for chum salmon are taken.

The commercial harvest of coho salmon in District 5 has ranged from 16,000 to 71,000 fish (Table 5). Intermittent aerial escapement surveys along with commercial catch data provide the only in-season assessment of run strength. Normally, three (Monday, Wednesday, Friday) 12-hour (0600 to 1800 hours) commercial fishing periods per week allow adequate spawning escapements and subsistence harvests. Inclement weather often disrupts fishing effort in District 5 during the coho salmon return. The three period per week schedule

usually compensates for any fishing time "lost" due to weather. District 5 closes by regulation on 8 September.

STATUS OF FISHERY AND STOCKS

Kuskokwim River (Districts 1 and 2)

Chinook Salmon

The combined commercial and subsistence chinook salmon harvest has increased from an average of 56,000 fish for the 10 year period 1960-1969 to 94,000 during 1980-1989 (Table 2). A commercial harvest target of 30,000 to 40,000 was in effect from 1973-1984 to stabilize catches until the result of such a harvest could be evaluated. Experience showed that the 30,000 to 40,000 harvest range was too high during weaker runs. In 1984 the Board of Fisheries reduced the range to 17-32,000 chinook salmon. The 1985 chinook salmon catch of 37,889 exceeded the harvest guideline while escapements were 25 to 43 percent of the desired objectives. The catch remained within the harvest guideline in 1986 and chinook salmon escapements were still 28 to 32 percent of the objectives. Chinook salmon objectives have been achieved, in most systems, since 1987. At the same time major changes in the management plan to conserve chinook salmon occurred. Harvests exceeding the harvest guideline also occurred during this period, suggesting that an increase in run size was primarily responsible for the increase in catch and escapement.

The six-inch mesh restriction has resulted in an improvement in quality of the escapement. The percent of females with gill net marks at the Kogrukluik weir has notably increased (Table 7). This appears to indicate a higher net survival rate among females. The commercial catch is showing an increase in the number of males and a decrease in the number of females. From 1982 - 1984 while using large mesh gear the commercial catch was 35 to 40 percent female. During the similar 1985 - 1987 period with the gear restrictions the commercial catch was 23 to 35 percent female. The gear change may also be responsible for the increased chinook salmon harvest since the commercial fishery is now targeting the smaller male fish that escape the large mesh subsistence nets.

Sockeye Salmon

The sockeye salmon catch is incidental to the chum salmon fishery in Districts 1 and 2 (Figures 2 and 3). Since the 1981 season, fishermen, processors and the Department have worked together to identify each species in the commercial harvest. Sockeye salmon have comprised 5 to 33 percent of the chum-sockeye salmon catch since 1981. In 1989 the commercial harvest was 41,651 sockeye salmon which was 5.4 percent of the chum-sockeye salmon catch (Table 3). Sockeye salmon escapement is documented incidentally to the other species. The Kogrukluik weir escapement estimate of 5,550 sockeye salmon in 1989 is above the average escapement of 2,000 sockeye salmon.

possible. However, the estimated exploitation rate appears to be low (Table 11). A review of the five years of total run size estimates for sockeye salmon resulted in lowering the escapement objective from 35,000 - 45,000 to 20,000 - 30,000. The next cycle will provide spawner - return data that will allow further refinements of the escapement objective.

The stock status of coho salmon is difficult to determine as aerial surveys are presently the only way to monitor escapement. Aerial surveys are often impossible due to weather conditions in late August and September. The commercial coho salmon catch data do not show any clear trend of abundance.

SEASON SUMMARY

The total 1989 Kuskokwim Area commercial salmon catch (Districts 1, 2, 4 and 5) consisted of 67,003 chinook, 82,628 sockeye, 556,312 coho, 819 pink and 802,199 chum salmon (Table 8). In 1989 the average Kuskokwim permit holder earned \$6,303 (Table 1). The total amount paid to fishermen was \$5,194,025, excluding bonuses and other incentives (Table 1). This is \$1,348,075 less than the previous five year average in spite of the catch being the second largest in the fishery's history. Below average prices for all species, except sockeye salmon, were responsible for the low value of the catch (Table 6). Coho salmon were the most valuable species bringing fishermen over two million dollars (Table 12). Chum salmon were the most abundant species in the catch and the second most valuable (Table 12).

Kuskokwim River (District 1 and 2)

The Kuskokwim River Salmon Working Group is composed of representatives of the Kuskokwim River salmon users. During the course of the season the Working Group met 27 times to evaluate the status of the salmon runs and make recommendations to the Department concerning commercial fishing periods. The Working Group dealt with most fishing periods individually, that is recommended one period at a time so that any unexpected changes in run strength could be dealt with. This strategy provided an excellent harvest and escapement in most systems.

The JOINT STATEMENT ON THE MANAGEMENT OF THE KUSKOKWIM RIVER SALMON FISHERY, adopted by the Board of Fisheries in 1987, requires announcement of the first period by 10 June. Based on high water preventing early subsistence fishing, the weather forecast, and past years data the Working Group felt that by 19 June chinook salmon would be incidental in District 1 downstream of Bethel. The Working Group then recommended that the first fishing period be on 19 June in District 1, downstream of Bethel (Stat. Area 335-11, Figure 2) in compliance with 5 AAC 07.365. KUSKOKWIM RIVER SALMON MANAGEMENT PLAN.

Fishermen's Strike

Only 374 fishermen participated in the first opening (Table 13), normally 575 to 600 boats participate in the first period. A fishermen's strike for higher prices caused the drop in effort. Several members of the public requested that the Working Group support the strike by not recommending any openings. After discussing the request, the Group decided to base management on run strength and not on fish prices. The strength of the chinook salmon run as shown by the test fisheries, the low numbers of chum salmon in the upper half of the district as shown by the subsistence catch reports, combined with the possible return to normal effort levels caused the group to recommend that only the portion of District 1 downstream of Bethel be opened for the second period to allow chum harvest while protecting chinook salmon.

The 8 hour fishing periods continued and so did the strike. Effort continued to drop until on 26 June only 126 boats fished in spite of the entire district being open for the first time (Table 13). On 30 June, effort increased to 642 boats with the end of the strike. District 2 opened for the first time on 30 June (Table 14). When subsistence catch reports indicated that chum salmon were the dominant species and that most people had completed their subsistence chinook fishing.

It is difficult to judge the effect of the strike in a system without a total run estimate. By comparing the 1989 commercial catches with years that had similar test fishing indices (test fishing was unaffected by the strike), an additional 10,000 to 12,000 chinook salmon and 5,000 sockeye salmon were estimated to have escaped because of the strike. Chinook salmon achieved escapement objectives in most systems for the third year in a row. Chinook escapement indices indicate that unusually large numbers did not escape because of the strike. Escapement objectives have not been established for sockeye salmon in the Kuskokwim River.

During the following week the consensus reached by the Working Group requested a somewhat shorter interval between fishing periods than the Department's recommendation. The later escapement counts in index streams indicated that this strategy allowed full utilization of chum salmon while still achieving the escapement objectives.

Chinook Salmon

The incidental chinook salmon catch was 43,217 in 1989, well above the average of 36,188 (Table 3). For the third time since 1981 chinook salmon reached escapement objectives in most index streams (Figure 6). An increase in the run size over recent years contributed to the improvement in catch and escapement. The Kwethluk River is one of several lower Kuskokwim spawning tributaries that have not achieved escapement objectives in recent years in spite of the drainage index reaching objective level. The Kwethluk River reached its objective of 1000 chinook for the first time since 1979. It is not possible to determine if this was a result of the strike or unusually successful survival in that stock of chinook salmon.

Sockeye Salmon

The sockeye salmon catch is incidental to the chum salmon fishery in the Kuskokwim River Districts. The 1989 catch of 43,000 was much lower than the previous 5 year average of 95,856 sockeye salmon (Table 3). The strike had an impact on the sockeye catch but test fishing results and commercial catches showed that the run was much smaller than in recent years. Sockeye salmon management is incidental to other species in the Kuskokwim River and there are no escapement objectives.

Chum Salmon

The chum salmon catch of 749,182 fish was the second largest on record for the Kuskokwim River (Table 3). This was the second year in a row that Kuskokwim River chum salmon achieved the escapement objectives and supported exceptional catches. The Working Group used all available information and determined that the chum salmon run was larger than normal. Fishing continued until 18 July when the Working Group recommended that fishing be suspended for 9 days. Reasons for the suspension included low chum salmon abundance, fish quality was deteriorating, chum escapement in the lower river tributaries was uncertain, and the coho salmon were not yet abundant.

In District 2, the chum salmon harvest of 20,946 was the largest on record, exceeding the 4,000 to 8,000 harvest guideline. The first fishing period on 30 June took the entire harvest guideline and was the largest single chum salmon period ever recorded in District 2 (Table 14). The above average magnitude of the run indicated that an increased harvest was allowable but the 1989 catch in District 2 was a higher percentage of the total than is normally the case. This was a result of the reduced effort in District 1 during the strike. This special circumstance was also a reason for exceeding the harvest guideline.

Coho Salmon

District 1 reopened on 27 July for coho salmon. The catch of 5,651 coho was the smallest for an opening period since 1975. The chum salmon catch of 5,716 exceeded the coho catch. Concern for run strength resulted in the Working Group recommending that the next period be delayed one week to 3 August. Fishing periods occurred every three days during early August. The large catch and the test fisheries suggested that the run was strong, however an uncharacteristic drop in both the commercial and test fishery catches occurred on August 15 and 18. Fortunately the Working Group insisted on continuing the one period at a time strategy in spite of a Department suggestion to set two periods. This allowed a closure following the unusually low catch of 5,938 coho on 18 August (Table 13). Test fishing results at the mouth of the river started improving the following day and by 21 August the test fishery at Bethel also showed improvement. The Working Group recommended a period on 23 August to allow fish to distribute themselves through out the district. That catch was typical for that stage of the run and the season continued normally to the regulatory closure on 1 September.

The total coho salmon catch of 479,856 was below the previous 5 year average of 508,561 (Table 3). Since 1979 - 80 the even year coho salmon runs have been larger than the odd year runs. The 1989 catch was the largest odd year catch in the history of the fishery (Table 3). It's below average because the record years (1984 & 1986) raise the average. Unusually high water washed out the Kogruklu River weir, the only coho salmon escapement project in the Kuskokwim River drainage, after 3 days of operation. The test fisheries and commercial catch per unit effort in District 2 suggest that escapement levels were normal.

Pink Salmon

Pink salmon harvest is incidental to the chum and coho salmon fishery in the Kuskokwim River. Pink salmon have a strong odd - even year cycle in the Kuskokwim River and 464 pink salmon is a normal odd year catch (Table 3). There is no pink salmon escapement program for the Kuskokwim River.

Roe Sales

The 1989 season was the first year that a processor registered to buy only roe in the Kuskokwim Area. Roe sales began on 19 June and continued until 9 August in the Kuskokwim River districts. Twenty-seven permit holders made 63 deliveries totaling 5,578 pounds of roe. Of these permit holders; 7 represent catcher sellers, 6 of whom sold their eggs in bulk to a local processor. Fish tickets for the roe do not represent individual permits so the total number of deliveries is not accurate. Catcher sellers sold roe from all species, whereas except for one coho roe sale, all other roe came from chum salmon. Commercial roe prices ranged from \$3.50 to \$4.00 a pound for a total ex-vessel value of \$22,166.

In previous years, all roe sales were between processors and catcher sellers. The catcher sellers' fish tickets already accounted for their fish and there was no need to convert their roe sales into fish. In 1989 all processors refused stripped salmon. Therefore, in order to account for the number of salmon the roe sales represented, the sex ratio of the commercial catch, combined with the average weight of roe per female provided an estimate of how many female salmon were stripped for egg sales. The commercial catch of each permit that sold roe included the estimated number of females. This resulted in an estimated 8,443 chum and 528 coho salmon having only their roe sold. Only one commercial roe fishermen did not deliver the males to another processor.

These 8,971 carcasses may have been utilized for subsistence purposes. There were several reports of "dumped" fish made to the Department and the Working Group. In response, the Working Group sent a letter to the villages informing them of what was happening. The letter also encouraged people participating in roe sales not to waste the fish and that the sale of roe from subsistence caught fish was illegal. The Department issued two separate news releases in response to public inquiries about selling subsistence caught roe. These news releases explained that subsistence roe sales were illegal.

Table 1. Estimated dollar value of Kuskokwim Area commercial salmon fishery, 1964-1989.

<u>YEAR</u>	<u>GROSS VALUE OF CATCH TO FISHERMAN</u>	<u>PERMITS FISHED*</u>	<u>AVERAGE INCOME</u>
1964	83,030		
1965	90,950		
1966	87,466		
1967	138,647		
1968	290,370		
1969	297,233		
1970	362,470		
1971	371,220		
1972	360,727		
1973	827,735		
1974	1,056,042		
1975	899,178		
1976	1,380,229		
1977	3,891,950		
1978	2,337,470		
1979	3,678,000		
1980	2,725,134		
1981	3,766,525		
1982	4,213,954		
1983	2,670,400		
1984	5,809,000	774	7,505
1985	3,248,089	781	4,159
1986	4,746,089	789	6,015
1987	6,392,822	798	8,011
1988	12,514,492	811	15,431
1989	5,194,025	824	6,303
FIVE YEAR AVERAGE (1984-1988)	\$6,542,100	791	8,224

* Permit holders who made at least one delivery. Information not available prior to 1983.

Table 2. Utilization of Kuskokwim River chinook salmon, 1960-1989.

<u>YEAR</u>	<u>COMMERCIAL HARVEST^a</u>	<u>ESTIMATED SUBSISTENCE HARVEST^b</u>	<u>TOTAL UTILIZATION</u>
1960	5,969	20,361	26,330
1961	18,918	30,910	49,828
1962	15,341	14,642	29,983
1963	12,016	37,246	49,262
1964	17,149	29,017	46,166
1965	21,989	27,143	49,132
1966	25,545	49,606	75,151
1967	29,986	57,875	87,861
1968	34,278	30,230	64,508
1969	43,997	40,138	84,135
1970	39,290	69,204	108,494
1971	40,274	42,926	83,200
1972	39,454	40,145	79,599
1973	32,838	38,526	71,364
1974	18,664	26,665	45,329
1975	21,720	47,784	69,504
1976	30,735	58,185	88,920
1977	35,830	55,577	91,407
1978	45,641	35,881	81,522
1979	38,966	55,524	94,490
1980	35,881	59,900	95,781
1981	47,663	59,669	107,332
1982	48,234	53,310	101,544
1983	33,174	52,000	85,174
1984	31,742	57,000	88,742
1985	37,889	42,277	80,166
1986	19,414	51,019	70,433
1987	36,179	67,352	103,504
1988	55,716	53,877	109,593
1989 ^c	43,217	54,305 ^d	97,522
Five Year Average (1984-1988)	36,188	54,305	90,493

^a District 1, 2 and 3.

^b Estimated subsistence harvest expanded from villages surveyed.

^c Preliminary harvest figures.

^d Previous five year average harvest since subsistence catch not available at this time.

Table 3. Lower Kuskokwim River, District 1, and the middle Kuskokwim River, District 2, commercial salmon harvest, 1960-1989.

Year	Chinook	sockeye	Coho	Pink	Chum	Total
1960	5,969	0	2,498	0	0	8,467
1961	18,918	0	5,044	0	0	23,962
1962	15,341	0	12,432	0	0	27,773
1963	12,016	0	15,660	0	0	27,676
1964	17,149	0	28,613	0	0	45,762
1965	21,989	0	12,191	0	0	34,180
1966	25,545	0	22,985	0	0	48,530
1967	29,986	0	56,313	0	148	86,447
1968	34,278	0	127,306	0	187	161,771
1969	43,997	322	83,765	0	7,165	135,249
1970	39,290	117	38,601	44	1,664	79,716
1971	40,274	2,606	5,253	0	68,914	117,047
1972	39,454	102	22,579	8	78,619	140,762
1973	32,838	369	130,876	33	148,746	312,862
1974	18,664	136	147,269	84	171,887	338,040
1975	21,720	23	81,945	10	181,840	285,538
1976	30,735	2,971	88,501	133	177,864	300,204
1977	35,830	9,379	241,364	203	248,721	535,497
1978	45,641	733	213,393	5,832	248,656	514,255
1979	38,966	1,054	219,060	78	261,874	521,032
1980	35,881	360	222,012	803	483,211	742,267
1981	47,663	48,375	211,251	292	418,677	726,258
1982	48,234	33,154	447,117	1,748	278,306	808,559
1983	33,174	68,855	196,287	211	267,698	566,225
1984	31,742	48,575	623,447	2,942	423,718	1,130,424
1985	37,889	106,647	335,606	75	199,478	679,695
1986	19,414	95,433	659,988	3,422	309,213	1,087,470
1987	36,179	136,602	399,467	43	574,336	1,146,627
1988	55,716	92,025	524,296	10,825	1,381,674	2,064,536
1989	43,217	42,747	479,856	464	749,182	1,315,466
Five Year Average (1984-1988)	36,188	95,856	508,561	3,461	577,684	1,221,750

Table 4. Quinhagak District commercial salmon harvest, 1960-1989.

<u>Year</u>	<u>Chinook</u>	<u>Sockeye</u>	<u>Coho</u>	<u>Pink</u>	<u>Chum</u>	<u>Total</u>
1960	0	5,649	3,000	0	0	8,649
1961	4,328	2,308	46	90	18,864	25,636
1962	5,526	10,313	0	4,340	45,707	65,886
1963	6,555	0	0	0	0	6,555
1964	4,081	13,422	379	939	707	19,528
1965	2,976	1,886	0	0	4,242	9,104
1966	278	1,030	0	268	2,610	4,186
1967	0	652	1,926	0	8,087	10,665
1968	8,879	5,884	21,511	75,818	19,497	131,589
1969	16,802	3,784	15,077	953	38,206	74,822
1970	18,269	5,393	16,850	15,195	46,556	102,263
1971	4,185	3,118	2,982	13	30,208	40,506
1972	15,880	3,286	376	1,878	17,247	38,667
1973	14,993	2,783	16,515	277	19,680	54,248
1974	8,704	19,510	10,979	43,642	15,298	98,133
1975	3,928	8,584	10,742	486	35,233	58,973
1976	14,110	6,090	13,777	31,412	43,659	109,048
1977	19,090	5,519	9,028	202	43,707	77,546
1978	12,335	7,589	20,114	47,033	24,798	111,869
1979	11,144	18,828	47,525	295	25,995	103,787
1980	10,387	13,221	62,610	21,671	65,984	173,873
1981	24,524	17,292	47,557	160	53,334	142,867
1982	22,106	25,685	73,652	11,838	33,346	166,627
1983	46,385	10,263	32,442	168	23,090	112,348
1984	33,652	17,258	135,342	16,249	50,424	252,925
1985	30,401	7,876	29,992	28	20,418	88,715
1986	22,835	21,484	57,544	8,700	29,700	140,263
1987	26,022	6,489	50,070	66	8,557	91,204
1988	13,872	21,534	68,591	21,258	29,183	154,438
1989	20,820	20,582	44,607	273	39,395	125,677
Five Year Average (1984-1988)	25,356	14,928	68,308	9,260	27,656	145,508

Table 7. Chinook salmon sex ratios and proportion of females with gill net marks, Kogrukluuk Weir, 1980-1989.

<u>Year</u>	<u>Escapement Estimate</u>	<u>Females</u>	<u>Sex Ratio (% Female)</u>	<u>% of Females with Gill Net Marks</u>
1980	6,572	1,045	15.9	a
1981	16,820	7,905	47.0	12.47
1982	12,185	5,995	49.2	12.99
1983	2,992	865	28.9	16.49
1984	4,928	1,119	22.7	11.08
1985	4,438	1,429	32.2	18.99
1986	4,296	987	23.0	19.43
1987 ^b	4,063			
1988	11,194	3,848	34.4	13.34
1989	11,940	4,127	34.6	16.46
1980-84 Average			32.74	10.61
1985-89 Average			31.05	17.06

a Gill net mark data was not reported.

b Sample sizes were too small to assess sex ratios and percentages of gill net marks.

Table 8. Kuskokwim Area commercial and subsistence salmon catches, 1913-1989.

Year	COMMERCIAL CATCH					Total	SUBSISTENCE CATCH			COMBINED TOTAL HARVEST
	Chinook	Sockeye	Coho	Pink	Chum		Chinook	Other ^a	Total	
1913	7,800					7,800				7,800
1914		2,667				2,667				2,567
1915										
1916	949					949				949
1917	7,878					7,878				7,878
1918	3,055					3,055				3,055
1919	4,836					4,836				4,836
1920	34,853					34,853				34,853
1921	9,854					9,854				9,854
1922	8,944	6,120				15,064		180,000		195,064
1923	7,254					7,254				7,254
1924	19,253	900	7,167	7,167		34,487	17,700	203,148	220,848	255,335
1925	1,644	5,800				7,444	10,800	230,850	241,650	249,094
1926									738,576	738,576
1927									286,254	286,254
1928									481,090	481,090
1929									560,196	560,196
1930	7,626	2,448				10,074			538,650	548,724
1931	8,541					8,541			389,367	397,908
1932	9,339					9,339			746,415	755,754
1933							6,290	443,998	450,288	450,288
1934							20,800	597,132	617,932	617,932
1935	6,448		8,296			14,744	22,930	554,040	576,970	591,714
1936	624					624	33,500	549,423	582,923	583,547
1937	480					480			537,111	537,591
1938	624		828			1,452	10,153	400,242	410,395	411,847
1939	134					134	14,000	125,425	139,425	139,559
1940	247		500			747	8,000	415,523	423,523	424,270
1941	187		674			861	8,000	415,523	423,523	424,384
1942							6,400	325,339	331,739	331,739
1943							6,400	325,339	331,739	331,739
1944										
1946	2,288		674			2,962				2,962
1947	5,356					5,356				5,356
1948										
1951	4,210					4,210				4,210
1952										
1954	57					57				57
1955										
1956										
1959	3,760					3,760				3,760
1960	5,969	5,649	5,498		3	17,119	18,752	301,753	320,505	337,624
1961	23,246	2,308	5,090	91	18,864	49,599	27,457	179,529	206,986	256,585
1962	20,867	10,313	12,598	4,340	45,707	93,825	13,455	161,849	175,304	269,129
1963	18,571		15,660			34,231	33,180	137,649	170,829	205,060
1964	21,230	13,422	28,992	939	707	65,290	29,017	190,191	219,208	284,498

- Continued -

Table 8. (page 2 of 2)

Year	COMMERCIAL CATCH						SUBSISTENCE CATCH				COMBINED TOTAL HARVEST
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Coho ^b	Small ^c	Total	
1965	24,965	1,886	12,191		4,242	43,284	24,697		250,878	275,575	318,859
1966	25,823	1,030	22,985	268	2,610	52,716	49,022		175,735	224,757	277,473
1967	29,986	652	58,239		8,235	97,112	60,919		214,468	275,387	372,499
1968	43,157	5,887	154,302	75,818	19,694	298,858	35,380		278,008	313,388	612,246
1969	64,777	10,362	110,473	1,251	50,377	237,240	40,208		204,105	244,313	481,553
1970	65,032	12,654	62,243	27,422	60,566	227,919	69,219	11,868	246,810	327,897	555,816
1971	44,936	6,054	10,006	13	99,423	160,432	42,926	6,899	116,391	166,216	326,648
1972	55,482	4,312	23,880	1,952	97,197	182,823	40,145	1,325	120,316	161,786	344,609
1973	51,374	5,224	152,408	634	184,207	393,847	38,526	23,746	179,259	241,531	635,378
1974	30,670	29,003	179,579	60,052	196,127	495,431	26,665	32,780	277,170	336,615	832,046
1975	27,799	17,535	109,814	899	223,532	379,579	47,569		176,389	223,958	603,537
1976	49,262	13,636	112,130	39,998	231,877	446,903	57,899	4,312	223,792	286,003	732,906
1977	58,256	18,621	263,728	434	298,959	639,998	57,925	12,193	203,397	273,515	913,513
1978	63,194	13,734	247,271	61,968	282,044	668,211	38,209	12,437	125,052	175,698	843,909
1979	53,314	39,463	308,683	574	297,167	699,201	57,031		163,451	220,482	919,683
1980	48,242	42,213	327,908	30,306	561,483	1,010,152	62,139	47,335	168,987	278,461	1,288,613
1981	79,378	103,940	278,587	463	483,635	950,003	63,248	28,301	163,554	255,103	1,205,106
1982	79,816	97,716	567,451	18,259	325,471	1,088,713	60,426	45,181	195,691	301,298	1,390,011
1983	93,676	90,834	249,018	379	306,554	740,461	51,020	2,834	149,172	203,026	943,487
1984	74,006	81,307	829,965	23,902	488,482	1,497,662	60,668	15,016	144,651	220,335	1,717,997
1985	74,083	121,221	382,096	111	224,680	802,191	45,718	24,667	131,484	201,869	1,004,060
1986	44,972	142,029	736,910	16,569	349,268	1,289,748	54,256	29,742	142,930	226,928	1,516,676
1987	65,558	170,849	478,594	163	603,274	1,318,438	71,804	18,085	102,555	192,444	1,510,882
1988	74,552	149,927	623,719	37,592	1,443,916	2,239,786	56,595	32,452	143,762	232,873	2,562,579
1989	67,003	82,628	556,312	819	802,199	1,508,961					
Five Year Average (1984-1988)	66,634	133,067	610,257	15,667	621,924	1,429,565	57,808	23,992	133,076	214,890	1,662,439

^a Primarily chum and coho salmon.

^b Reported subsistence coho salmon harvest only. Coho salmon subsistence harvest is poorly documented with no Kuskokwim River estimate attempted.

^c Includes sockeye, pink and chum salmon.

Table 9. Lower Kuskokwim River, District 1, commercial effort, 1970-1989.

YEAR	UNRESTRICTED	RESTRICTED	COHO SALMON				TOTAL
	MESH SEASON	MESH SEASON	SEASON				
1970	361	a	266				387
1971	418	216	83				422
1972	405	176	245				425
1973	456	341	411				530
1974	606	467	516				666
1975	472	540	533				737
1976	561	517	516				674
1977	563	522	572				653
1978	615	61	597				723
1979	591	617	613				685
1980	553	579	586				663
1981	589	613	586				679
1982	610	576	596				686
1983	544	619	577				679
1984	520	587	619				654
1985	b	598	627				654
1986	b	631	663				688
1987	b	680	694				703
1988	b	c	c				746
	Number of Permits Landing Each Species						
	Chinook	Sockeye	Coho	Pink	Chum	Roe	
1989	695	688	732	261	719	22	745
Five Year Average (1984-1988)							689

- ^a No commercial salmon season.
- ^b No unrestricted mesh season.
- ^c Fishery continued without interruption

Table 10. Middle Kuskokwim River, District 2, commercial effort, 1970-1989.

<u>YEAR</u>	<u>UNRESTRICTED MESH SEASON</u>	<u>RESTRICTED MESH SEASON</u>	<u>COHO SALMON SEASON</u>	<u>TOTAL</u>		
1970	10	a	11	18		
1971	22	a	a	22		
1972	12	a	a	12		
1973	28	a	a	28		
1974	36	a	16	37		
1975	38	a	a	38		
1976	55	a	11	57		
1977	83	54	24	105		
1978	28	a	16	43		
1979	41	a	20	43		
1980	37	21	12	43		
1981	153	11	16	153		
1982	38	50	25	60		
1983	14	42	9	43		
1984	15	49	32	58		
1985	b	17	16	23		
1986	b	21	35	43		
1987	b	24	20	29		
1988	b	19	21	29		
	<u>Number of Permits Landing Each Species</u>					
	<u>Chinook</u>	<u>Sockeye</u>	<u>Coho</u>	<u>Pink</u>	<u>Chum</u>	<u>Roe</u>
1989	20	19	29	8	26	2
Five Year Average (1984-1988)						36

^a No commercial salmon season.

^b No unrestricted mesh season.

Table 11. Historical estimated run size and commercial exploitation rate, Goodnews River, 1981-1988.

Year	Species	Middle Fork Tower Estimate	Middle Fork Aerial Survey Count as a Percentage of Tower Estimate	Goodnews River Escapement Estimate	Goodnews Bay Subsistence Harvest Estimate	Goodnews Bay Commercial Harvest	Goodnews Bay Total Run Size Estimate	Exploitation ^a Percentage of Run Size
1981 ^b	Chinook	3,688	-	-	1,409	7,190	-	-
	Sockeye	49,108	-	-	3,511 ^c	40,273	-	-
	Chum	21,827	-	-	-	13,642	-	-
1982 ^b	Chinook	1,395	-	-	1,236	9,476	-	-
	Sockeye	56,255	-	-	2,754 ^c	38,877	-	-
	Chum	6,767	-	-	-	13,829	-	-
1983	Chinook	6,027	36%	14,398	1,066	14,117	29,581	51%
	Sockeye	25,816	22%	69,935	1,518 ^c	11,716	83,189	16%
	Chum	15,548	-	-	-	6,766	-	-
1984	Chinook	3,260	35%	8,743	629	8,612	17,984	51%
	Sockeye	32,053	27%	67,213	964	15,474	83,651	20%
	Chum	19,003	35%	117,739	189	14,340	132,268	11%
1985	Chinook	2,831	70%	7,979	426	5,793	14,198	44%
	Sockeye	24,131	11%	50,481	704	6,698	57,883	13%
	Chum	10,367	32%	25,025	348	4,784	30,157	17%
1986	Chinook	2,083	57%	4,094	553	2,723	7,372	44%
	Sockeye	51,069	28%	93,228	942	22,608	116,778	20%
	Chum	14,765	38%	31,910	191	10,355	62,456	17%
1987	Chinook	2,274	100%	4,490	816	3,357	8,663	48%
	Sockeye	28,871	85%	51,989	933	27,758	80,702	36%
	Chum	17,519	56%	37,802	578	20,381	58,761	36%
1988	Chinook	2,712	39%	5,419	310	4,964	10,693	46%
	Sockeye	15,799	30%	38,319	1,065	36,368	75,752	48%
	Chum	20,799	21%	39,501	448	33,059	73,008	45%
1989 ^d	Chinook							
	Sockeye							
	Chum							

a Commercial and subsistence exploitation

b Incomplete aerial survey results.

c Subsistence caught chum salmon is included in subsistence sockeye salmon harvest.

d Preliminary figures.

Table 12. 1989 Kuskokwim Area commercial salmon fishery final calculated value by district and area.

	<u>CHINOOK</u>	<u>SOCKEYE</u>	<u>CORO</u>	<u>PINK</u>	<u>CRUM</u>	<u>DISTRICT TOTAL</u>
<u>LOWER KUSKOKWIM DISTRICT 1</u>						
TOTAL FISH	41,834	41,851	462,935	446	728,236	1,275,102
TOTAL POUNDS	630,756	306,381	3,293,385	1,534	4,930,158	9,162,214
TOTAL DOLLARS	\$473,067	\$367,567	\$1,811,361	\$77	\$1,268,058	\$3,920,130
AVERAGE WEIGHT	15.11	7.40	7.14	3.44	6.77	
<u>MIDDLE KUSKOKWIM DISTRICT 2</u>						
TOTAL FISH	1,383	1,061	16,921	18	20,946	40,329
TOTAL POUNDS	23,125	7,674	115,884	75	143,178	289,936
TOTAL DOLLARS	\$17,343	\$9,208	\$63,736	\$3	\$37,226	\$127,516
AVERAGE WEIGHT	16.70	7.00	6.80	4.10	6.80	
<u>QUINAGAK DISTRICT 4</u>						
TOTAL FISH	20,820	20,582	44,607	273	39,395	125,677
TOTAL POUNDS	402,388	144,133	356,070	860	284,729	1,188,180
TOTAL DOLLARS	\$301,791	\$172,959	\$193,838	\$43	\$74,029	\$744,660
AVERAGE WEIGHT	19.30	7.00	7.40	3	7.20	
<u>GOODNEWS BAY DISTRICT 3</u>						
TOTAL FISH	2,966	19,299	31,849	82	13,622	67,818
TOTAL POUNDS	52,496	136,917	273,029	333	98,847	361,622
TOTAL DOLLARS	\$39,372	\$164,300	\$150,165	\$17	\$25,700	\$379,554
AVERAGE WEIGHT	17.70	7.10	8.1	4.00	7.20	
<u>TOTAL ALL DISTRICTS</u>						
TOTAL FISH	67,003	82,628	556,312	819	802,199	1,508,961
TOTAL POUNDS	1,108,765	595,415	4,028,368	2,799	5,454,953	11,190,300
TOTAL DOLLARS	\$831,573	\$714,034	\$2,221,100	\$140	\$1,418,288	\$5,171,860
AVERAGE WEIGHT	16.55	7.20	7.26	3.42	6.80	
AVERAGE PRICE/LB	\$0.75	\$1.20	\$0.55	\$0.05	\$0.26	
PRICE/FISH	\$12.41	\$8.65	\$3.99	\$0.17	\$1.77	
ROE SALES ^a						\$22,165
GRAND TOTAL FOR AREA						\$5,194,025

^a All roe sales were made in Districts 1 and 2.

Table 13. Lower Kuskokwim River, District 1, commercial salmon harvest and fishing effort by period, 1989.

Date	Permits	Lndas	Chinook		Sockeye		Coho		Pink		Chum	
			No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
06/19	374	442	9,204	3.08	5,495	1.84	0	0.00	0	0.00	41,789	13.97
06/23	277	400	6,011	2.71	7,011	3.16	0	0.00	0	0.00	65,650	29.63
06/26	126	194	1,862	1.85	3,746	3.72	0	0.00	0	0.00	32,373	32.12
06/30	642	858	9,232	1.80	10,214	1.99	0	0.00	8	0.00	131,629	26.63
07/03	629	708	4,600	1.22	3,808	1.54	0	0.00	14	0.00	91,345	24.20
07/05	553	607	3,311	1.00	2,917	0.88	3	0.00	41	0.01	85,727	25.84
07/08	621	697	3,136	0.84	3,177	0.85	9	0.00	67	0.02	119,066	31.96
07/11	616	642	1,691	0.46	1,565	0.42	126	0.03	69	0.02	78,033	21.12
07/14	590	604	1,216	0.34	796	0.22	230	0.06	49	0.01	44,401	12.54
07/18	437	447	868	0.33	451	0.17	2,216	0.85	53	0.02	26,407	10.07
07/27	562	565	210	0.06	95	0.03	5,651	1.68	41	0.01	5,716	1.70
08/03	679	778	174	0.03	30	0.01	99,022	18.23	32	0.01	3,615	0.67
08/07	642	666	78	0.02	22	0.01	73,514	19.08	25	0.01	868	0.23
08/09	644	772	40	0.01	7	0.00	103,158	26.70	11	0.00	432	0.11
08/12	650	682	34	0.01	8	0.00	81,970	21.02	13	0.00	122	0.03
08/15	616	626	25	0.01	4	0.00	23,071	6.24	7	0.00	119	0.03
08/18	381	383	7	0.00	5	0.00	5,938	2.60	4	0.00	16	0.01
08/23	528	543	19	0.01	14	0.00	30,940	9.77	4	0.00	21	0.01
08/26	508	526	17	0.00	13	0.00	20,881	5.14	3	0.00	15	0.00
08/29	423	430	7	0.00	9	0.00	11,080	3.27	4	0.00	21	0.01
09/01	194	195	3	0.00	1	0.00	3,225	2.77	1	0.00	7	0.01
ADP&C ^a	2	16	89		263		1,901		0		844	
Total	745	11,780	41,834	0.66	41,651	0.71	462,935	5.59	446	0.01	728,236	10.95
Average wt. (lbs)			15.10		7.40		7.14		3.44		6.77	

^a fish caught by Alaska Department of Fish and Game test fish projects

Table 14. Middle Kuskokwim River, District 2, commercial salmon harvest and fishing effort by period, 1989.

Date	Permits	Lndas	Chinook		Sockeye		Coho		Pink		Chum	
			No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
06/30	15	18	610	5.08	587	4.89	0	0.00	0	0.00	7,353	61.28
07/03	18	20	371	3.44	238	2.20	0	0.00	0	0.00	5,101	47.23
07/05	14	14	264	3.14	176	2.10	0	0.00	0	0.00	3,542	42.17
07/11	14	16	128	1.52	95	1.13	0	0.00	13	0.15	4,580	54.52
08/07	22	23	3	0.02	0	0.00	6,607	50.05	2	0.02	238	1.80
08/09	18	19	3	0.03	0	0.00	5,714	52.91	0	0.00	114	1.06
08/15	15	15	1	0.01	0	0.00	1,867	20.74	2	0.02	7	0.08
08/18	20	20	3	0.03	0	0.00	2,733	22.78	1	0.01	11	0.09
Total	30	145	1,383	1.66	1,096	1.29	16,921	18.31	18	0.03	20,946	26.03
Average wt. (lbs)			16.72		7.00		6.85		4.17		6.84	

Table 15. Kuskokwim area district transfers, 1989.

<u>DISTRICT W-1 HOME</u>		<u>DISTRICT W-2 HOME</u>	
To W-2:	13	To W-1:	11
To W-4:	127	To W-4:	2
To W-5:	23	To W-5:	0
<u>DISTRICT W-4 HOME</u>		<u>DISTRICT W-5 HOME</u>	
To W-1:	48	To W-1:	1
To W-2:	0	To W-2:	0
To W-5:	11	To W-4:	10
Total 1989 transfers:	256		
Total 1988 transfers:	283		
Total 1987 transfers:	320		

Table 16. Quinhagak, District 4, commercial salmon harvest and fishing effort by period, 1989.

Date	Permits	Ldgs	Chinook		Sockeye		Coho		Pink		Chum	
			No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
06/15	140	148	3,415	2.03	134	0.08	0	0.00	0	0.00	1,122	0.67
06/19	85	113	3,525	3.46	741	0.73	0	0.00	0	0.00	1,913	1.88
06/23	85	110	2,039	2.00	1,741	1.71	0	0.00	0	0.00	1,774	1.74
06/26	74	77	1,741	1.96	1,717	1.93	0	0.00	0	0.00	1,529	1.72
06/30	83	90	1,185	1.19	2,095	2.10	0	0.00	7	0.01	4,903	4.92
07/03	78	107	2,771	2.96	3,191	3.41	0	0.00	13	0.01	1,788	1.91
07/05	62	95	2,710	3.64	1,810	2.43	0	0.00	12	0.02	6,778	9.11
07/07	95	96	1,228	1.08	2,490	2.18	0	0.00	0	0.00	2,939	2.58
07/10	108	113	646	0.50	2,229	1.72	0	0.00	0	0.00	4,774	3.68
07/12	85	86	450	0.44	1,468	1.44	0	0.00	45	0.04	3,211	3.15
07/14	68	70	220	0.27	878	1.08	1	0.00	25	0.03	732	0.90
07/18	66	91	260	0.33	694	0.88	25	0.03	8	0.01	4,343	5.48
07/21	105	112	248	0.20	477	0.38	124	0.10	38	0.03	1,941	1.54
07/24	57	59	83	0.12	215	0.31	63	0.09	38	0.06	499	0.73
07/27	51	52	76	0.12	156	0.25	226	0.37	12	0.02	465	0.76
07/31	69	77	46	0.06	210	0.25	925	1.12	20	0.02	191	0.23
08/02	67	74	45	0.06	94	0.12	962	1.20	14	0.02	185	0.23
08/04	64	75	30	0.04	93	0.12	1,755	2.29	15	0.02	116	0.15
08/07	74	103	27	0.03	30	0.03	8,188	9.22	3	0.00	101	0.11
08/09	76	87	22	0.02	34	0.04	5,295	5.81	3	0.00	33	0.04
08/11	72	94	8	0.01	6	0.01	7,376	8.54	1	0.00	4	0.00
08/14	101	103	12	0.01	17	0.01	1,671	1.38	4	0.00	13	0.01
08/16	58	68	6	0.01	11	0.02	1,622	2.33	3	0.00	8	0.01
08/18	77	118	10	0.01	11	0.01	8,824	9.55	6	0.01	7	0.01
08/21	87	90	7	0.01	23	0.02	2,110	2.02	0	0.00	9	0.01
08/23	67	72	5	0.01	7	0.01	2,400	2.99	4	0.00	10	0.01
08/25	60	65	5	0.01	7	0.01	1,633	2.27	2	0.00	5	0.01
09/01	52	64	0	0.00	3	0.00	1,407	2.25	0	0.00	2	0.00
09/08	0	0										
----- NO BUYERS -----												
Total	227	2,509	20,820	0.73	20,582	0.76	44,607	1.84	273	0.01	39,395	1.49
Average wt. (lbs)			19.33		7.00		7.98		3.15		7.23	

Table 17. Goodnews Bay, District 5, commercial salmon harvest and fishing effort by period, 1989.

Date	Permits	Ldgs	Chinook		Sockeye		Coho		Pink		Chum	
			No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
6/19	18	23	390	1.81	551	2.55	0	0.00	0	0.00	557	2.58
6/23	27	29	583	1.80	1,466	4.52	0	0.00	0	0.00	886	2.73
6/26	30	30	416	1.16	1,909	5.30	0	0.00	0	0.00	1,241	3.45
6/30	33	36	460	1.16	2,037	5.14	0	0.00	0	0.00	1,349	3.41
7/03	38	43	156	0.34	2,589	5.68	0	0.00	0	0.00	1,309	2.87
7/05	26	26	95	0.30	1,254	4.02	0	0.00	0	0.00	976	3.13
7/07	41	42	196	0.40	2,083	4.23	0	0.00	0	0.00	1,809	3.68
7/10	45	50	203	0.38	1,759	3.26	0	0.00	9	0.02	2,085	3.86
7/14	42	45	210	0.42	1,656	3.29	1	0.00	4	0.01	1,963	3.89
7/21	41	45	44	0.09	887	1.80	18	0.04	7	0.01	440	0.89
7/24	37	40	23	0.05	588	1.32	33	0.07	9	0.02	315	0.71
7/27	33	33	26	0.07	419	1.06	68	0.17	6	0.02	162	0.41
7/31	31	31	20	0.05	300	0.81	364	0.98	4	0.01	92	0.23
8/02	34	35	26	0.06	256	0.63	891	2.18	6	0.01	92	0.23
8/04	31	33	17	0.05	208	0.56	878	2.36	0	0.00	36	0.10
8/07	30	32	15	0.04	178	0.49	812	2.26	2	0.01	16	0.04
8/09	31	33	18	0.05	135	0.36	2,163	5.81	2	0.01	45	0.12
8/11	28	29	15	0.04	80	0.24	2,550	7.59	5	0.01	25	0.07
8/14	32	38	11	0.03	122	0.32	2,374	6.18	3	0.01	62	0.16
8/16	37	43	6	0.01	110	0.25	2,557	5.76	3	0.01	14	0.03
8/18	46	51	8	0.01	96	0.17	3,864	7.00	4	0.01	6	0.01
8/21	60	66	7	0.01	239	0.33	3,459	4.80	3	0.00	127	0.18
8/23	53	57	7	0.01	88	0.14	3,417	5.37	2	0.00	6	0.01
8/25	55	62	1	0.00	90	0.14	3,590	5.44	1	0.00	4	0.01
8/28	65	68	8	0.01	74	0.09	2,235	2.87	4	0.01	2	0.00
8/30	57	58	4	0.01	68	0.10	1,483	2.17	7	0.01	2	0.00
9/01	45	51	1	0.00	57	0.11	1,092	2.02	1	0.00	1	0.00
9/08	0	0										
							----	NO BUYERS	----			
Total	88	1,129	2,966	0.31	19,299	1.74	31,849	2.34	82	0.01	13,622	1.22
Average wt. (lbs)			17.7		7.09		8.57		4.06		7.26	

Table 18. Preliminary projections of the 1990 Alaska commercial salmon harvests in thousands of fish by management region and species.

<u>Species</u>	<u>Management Region</u>		<u>Total</u>
	<u>Kuskokwim River</u>	<u>Kuskokwim Bay</u>	<u>Kuskokwim Area^a</u>
Chinook	19 - 56	16 - 42	35 - 98
Sockeye	41 - 137	13 - 58	54 - 195
Coho	222 - 660 ^b	77 - 206 ^b	299 - 866
Pink	0.8 - 11 ^b	13 - 29 ^b	14 - 40
Chum	199 - 1,380	13 - 83	212 - 1,463
Total	482 - 2,244	132 - 418	614 - 2,662

^a Except as noted all the projections are based on the previous (1984-89) average catches in all districts.

^b Kuskokwim Area pink and coho salmon have displayed a strong odd-even cycle in recent years. This projection is based on the even year catch for the previous 10 years.

FIGURES

**Kuskokwim Mangement Area
District W-1
Kuskokwim River**

 Closed to Commercial Fishing
Closed to Subsistence Fishing
before, during, and after
commercial periods in district 1

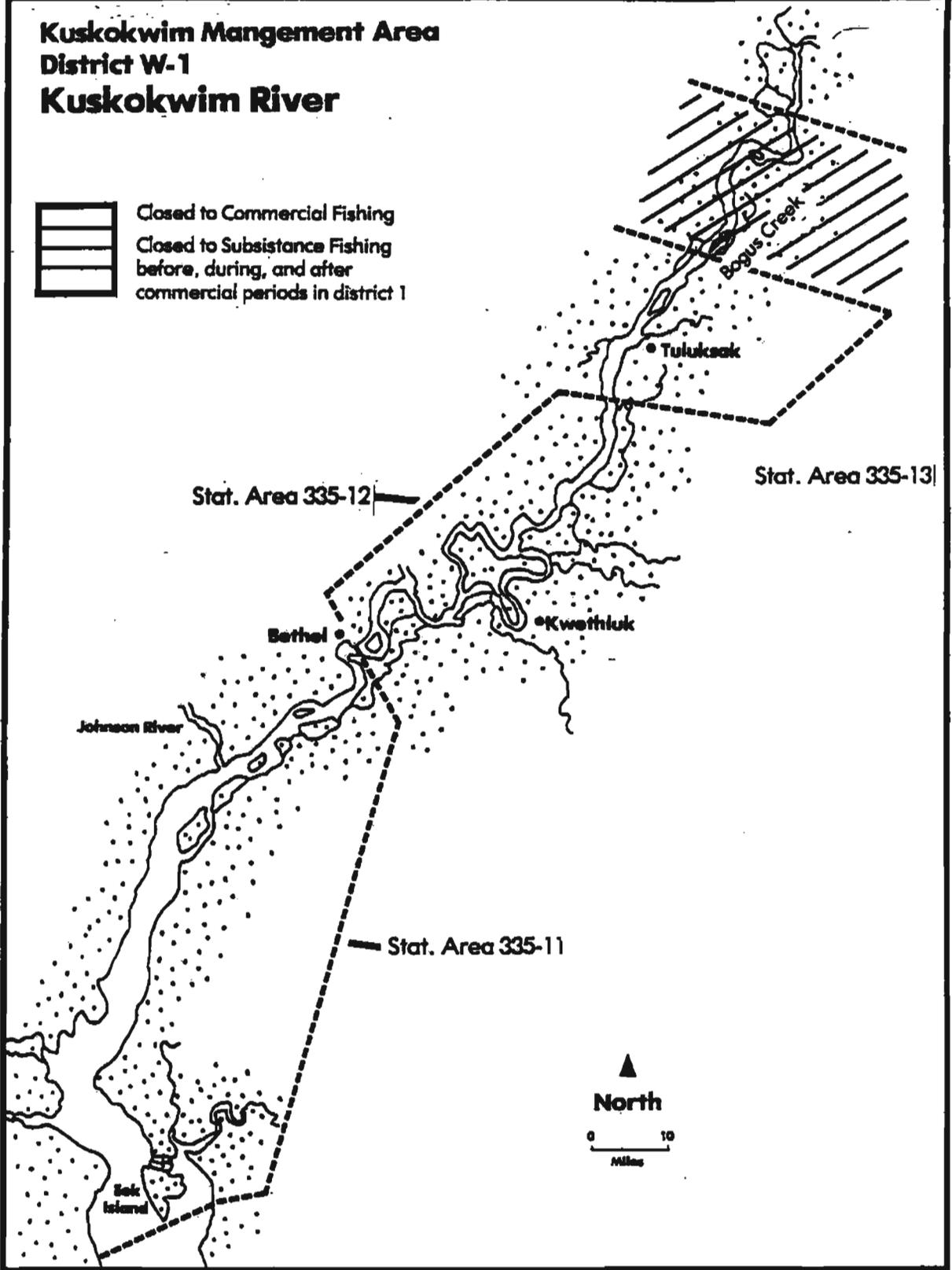


Figure 2. Kuskokwim Management Area, District W-1

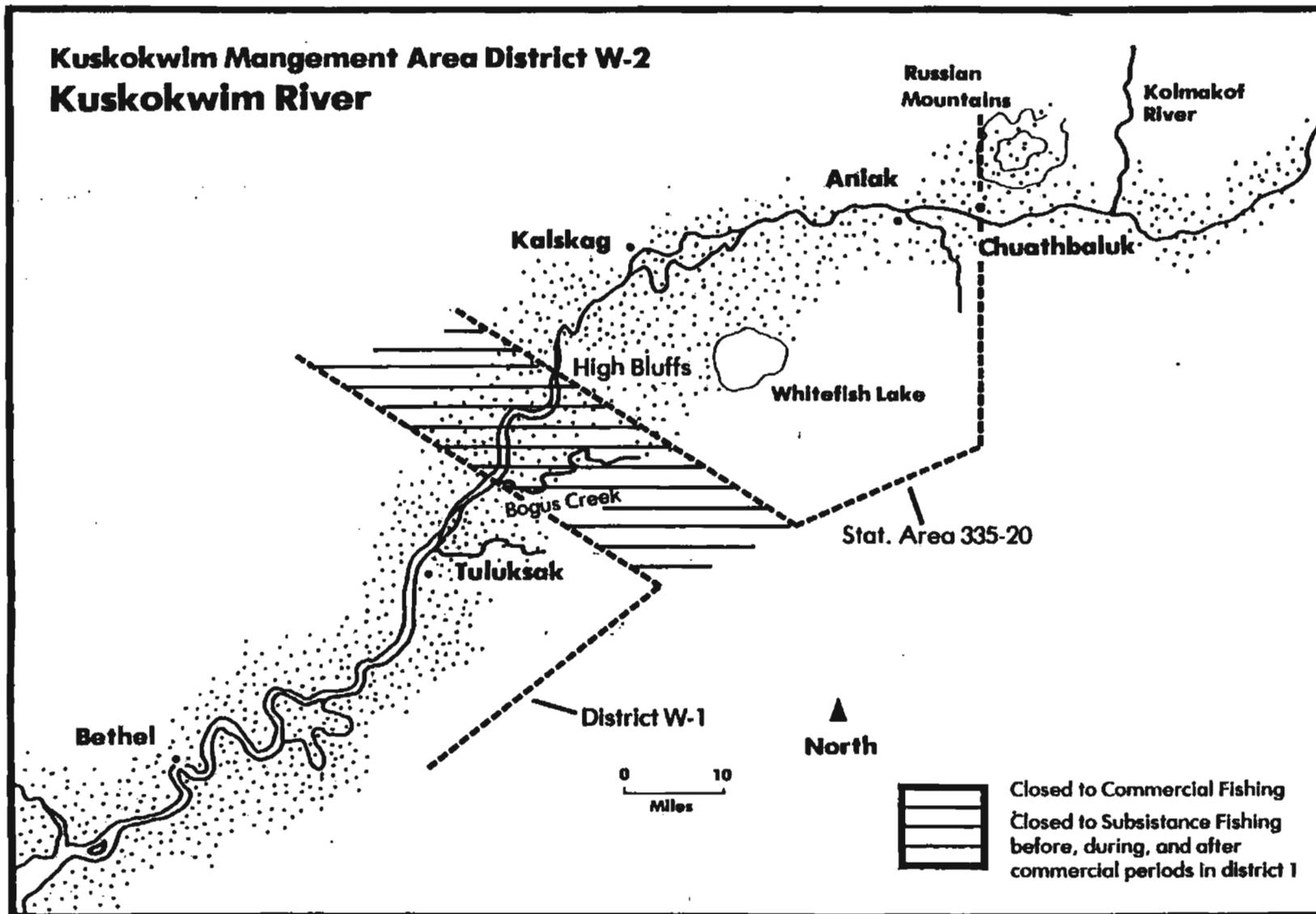
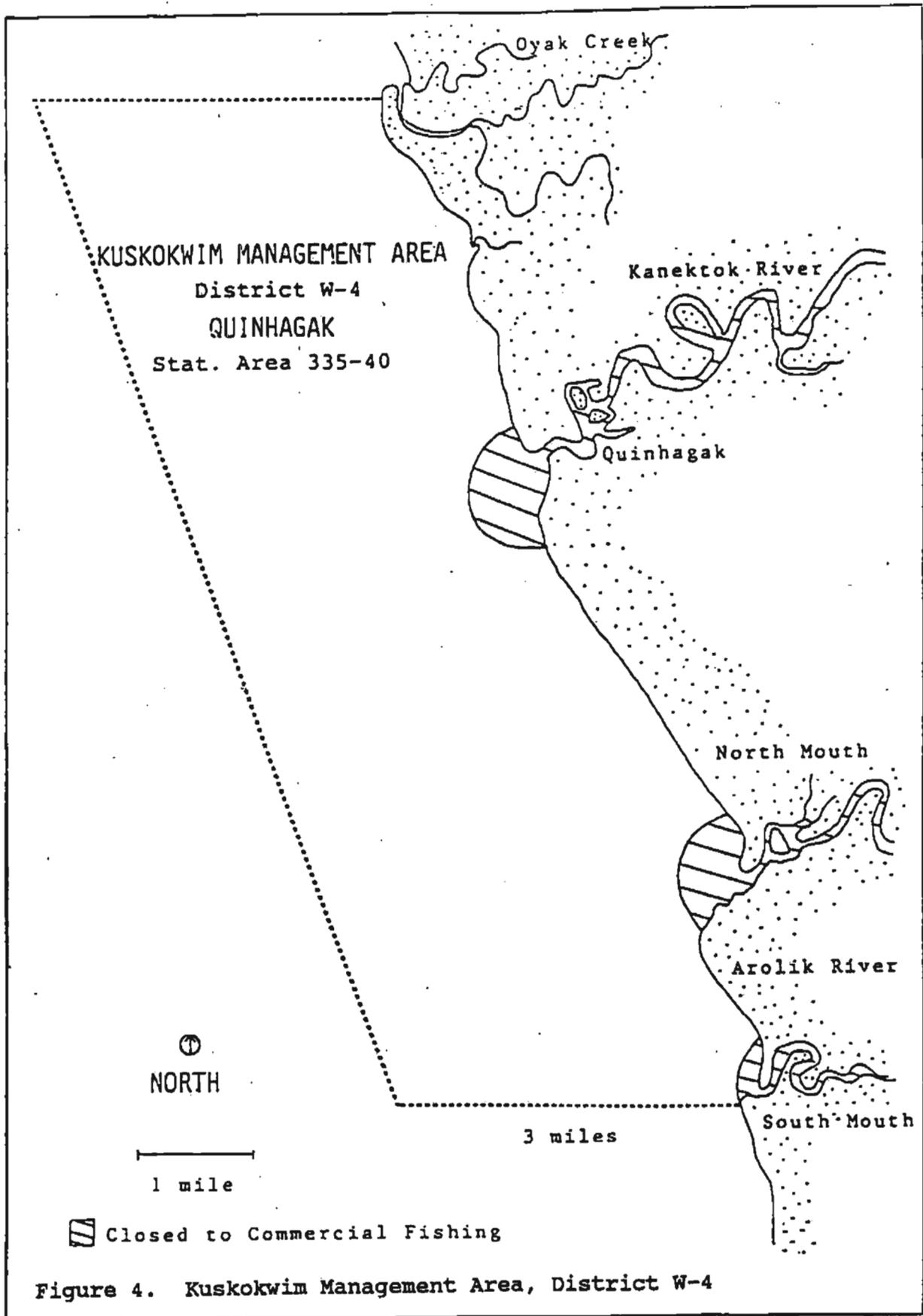


Figure 3. Kuskokwim Management Area, District W-2



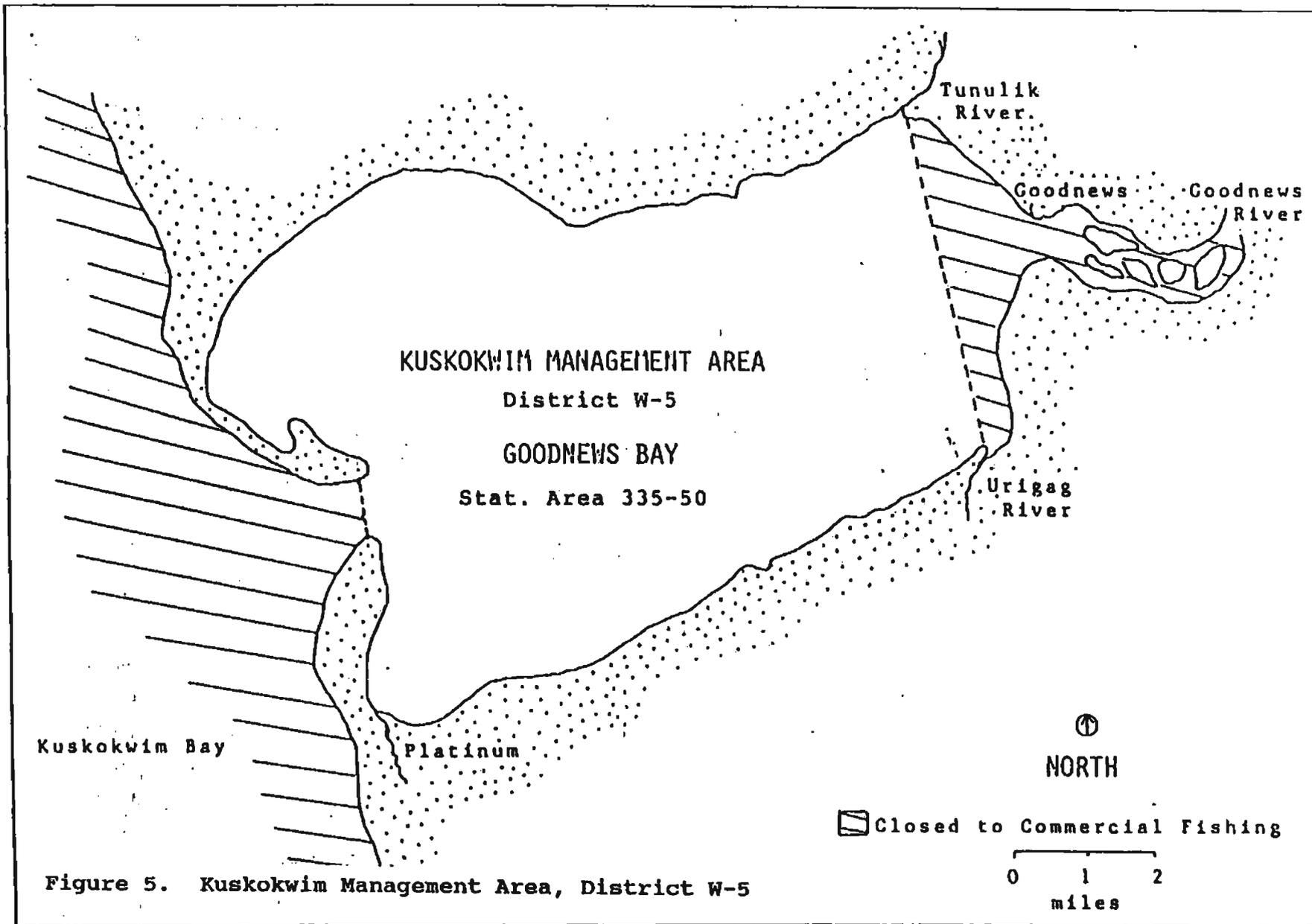


Figure 5. Kuskokwim Management Area, District W-5

Kuskokwim River Aerial Index

Chinook Salmon, 1975-1989

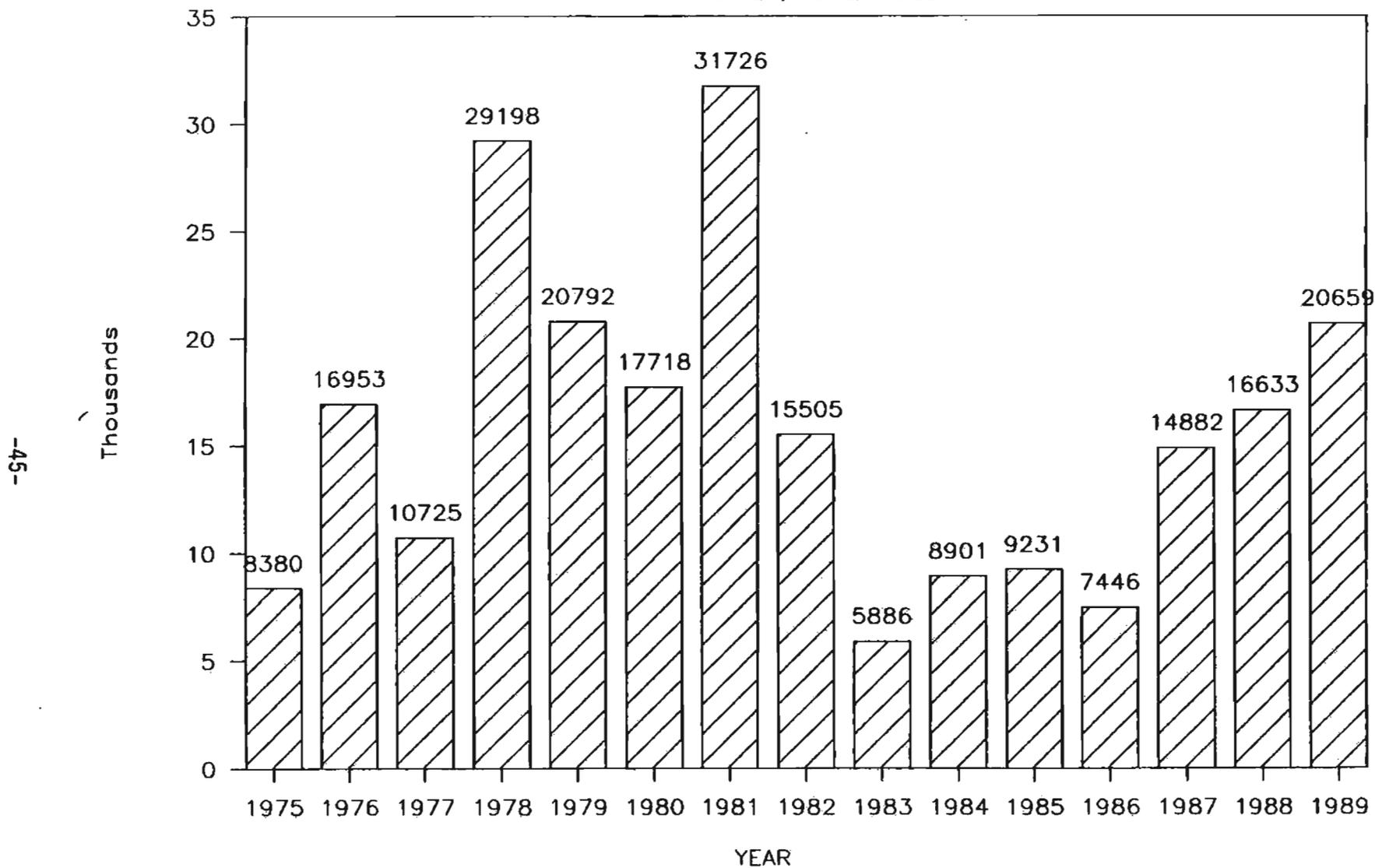


Figure 6. Kuskokwim River drainage aerial chinook salmon escapement index.